

Motion Radar Sensor

RAD Series



Motion Radar Sensor is a digital uni or bidirectional motion sensor for trouble-free opening of all types of automatic doors (sliding, swinging, folding, revolving, speed-doors, overhead doors, etc...), for pedestrian and civil applications.

It can be adapted to every application without further accessories and can be controlled by an infrared remote controller. Mounting height up to 4m (13.12ft) also available in uni- or bidirectional mode to detect motion towards or away from the device. Like most of other microwave detectors, equipped with planar flat antenna, Carlo Gavazzi Radar activates automatic doors utilizing doppler shift effect for detecting movements.

Safety Notes

Read Instructions!
Before working with this unit, read these instructions carefully and completely. Make sure that you have understood all the information!

Disconnect system from supply network
Before any installation, maintenance or modification work:
Disconnect your system from the supply network. Ensure that cannot be re-connected inadvertently!

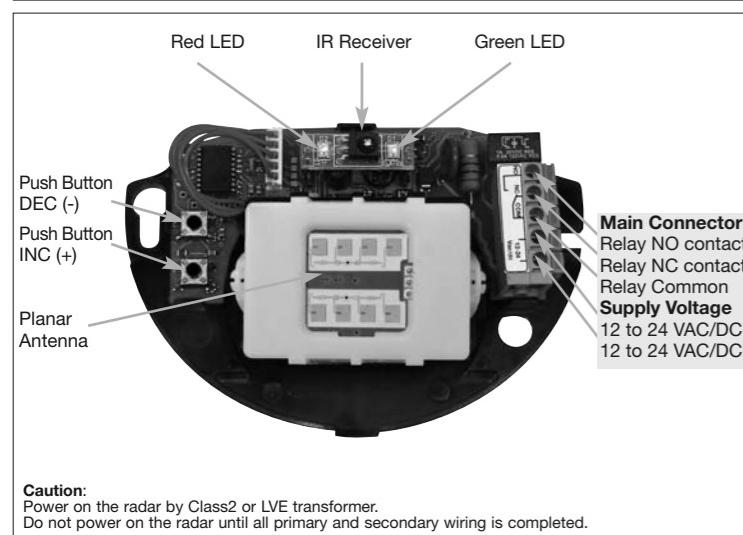
Before start of operation ensure appropriate installation

Warning! Improper installation / operation impair safety and result in operational difficulties or complete failure of the unit.
The unit must be installed and put into service appropriately by qualified personnel. Compliance with the relevant regulations must be ensured.

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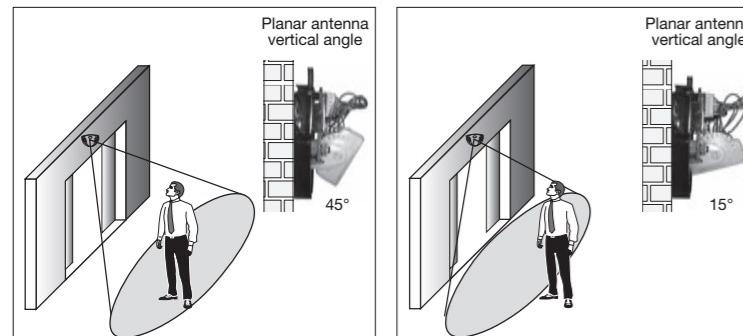
This manual accompanies our equipment for use by the end users. The technical instructions and illustrations contained in this manual are to be treated as confidential and no part may be reproduced without the prior written permission of Carlo Gavazzi. Service engineers and end users may not divulge the information contained herein or use this manual for purposes other than those strictly connected with correct use of the equipment. Specifications are subject to change without notice. Pictures are just an example.

Electrical Connections



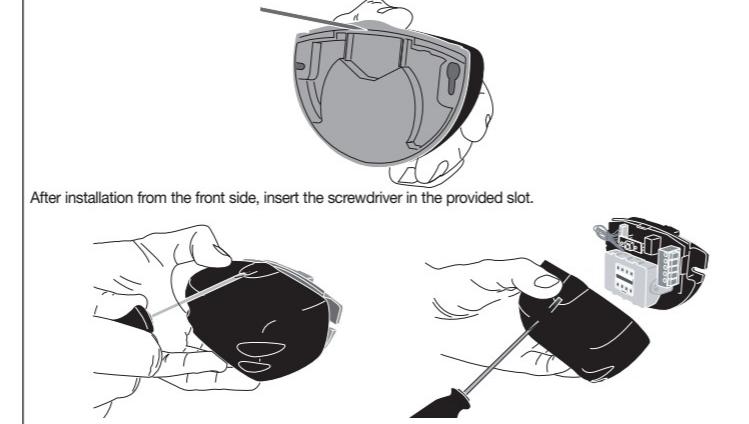
Sensing Field adjustment

Mechanical sensor orientation

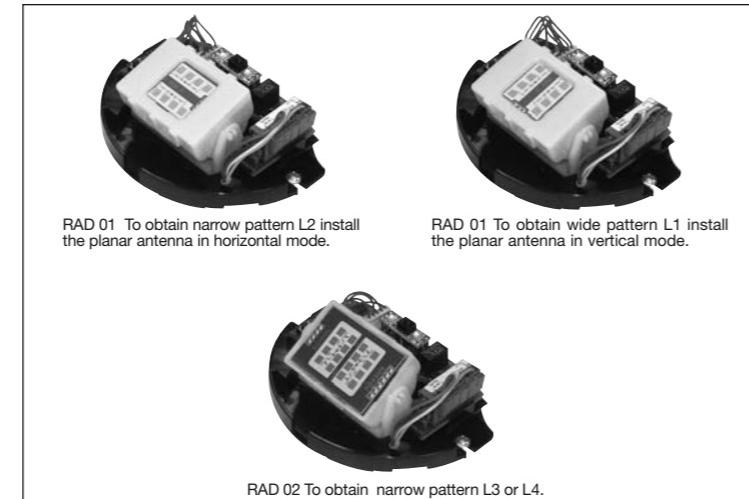


Cover Removing

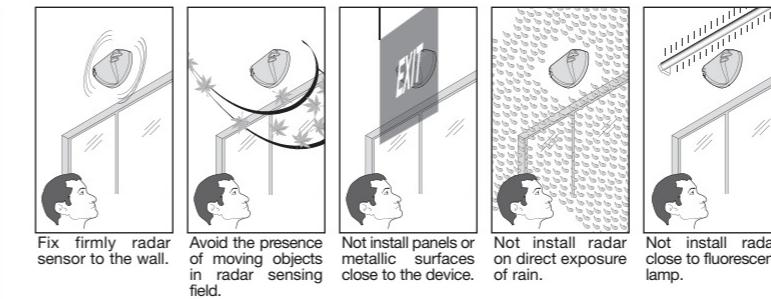
Remove cover from behind, before installation.



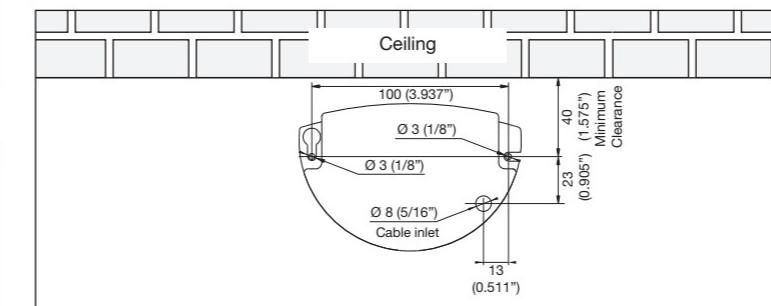
Inside View



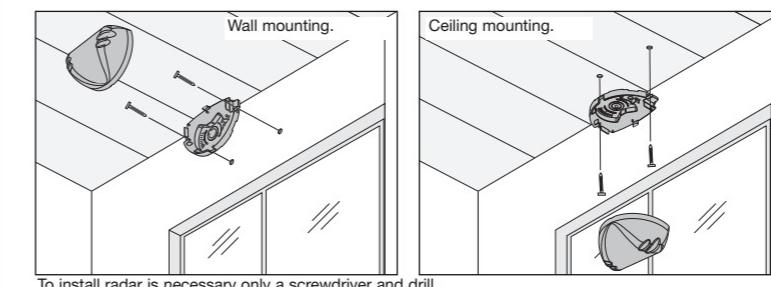
Installation Tips



Drilling Plan mm (inches)



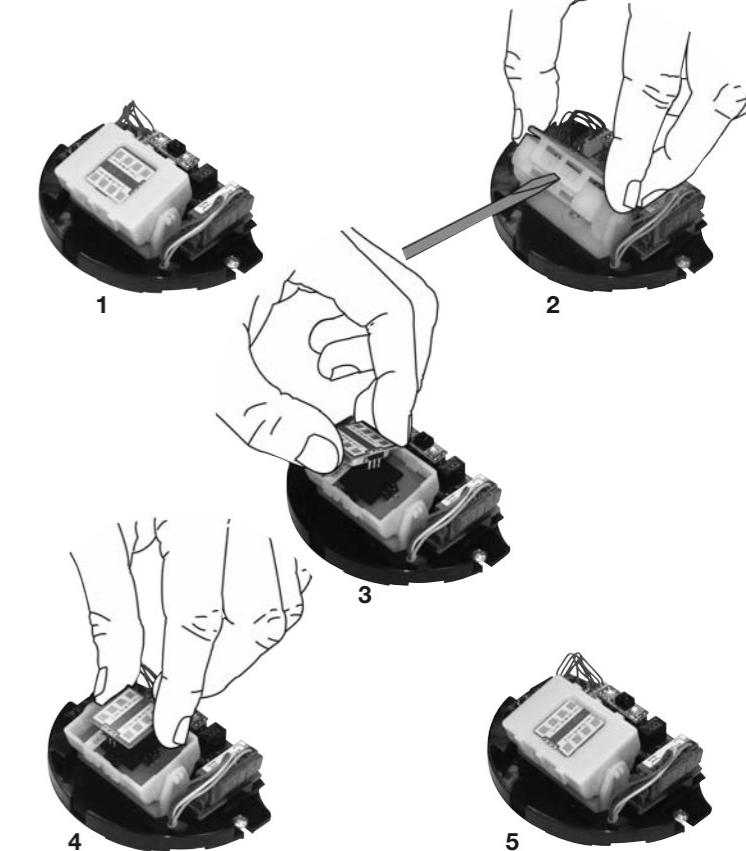
Mounting Instructions



Detection Area Shape modifying instructions

To adjust the type of the sensing field and pattern, verify the following instructions:

RAD 01 To obtain wide pattern install the planar antenna in vertical mode, while to obtain narrow pattern install the planar antenna in horizontal mode. Carefully remove the fixing tie clip with a screwdriver and change the orientation mode of planar antenna.



CAUTION!
Power off the radar before removing the planar antenna.
The radar is an electrostatic sensitive device: proceed with caution to remove the planar antenna, don't wear synthetic clothes or rubber sole shoes.

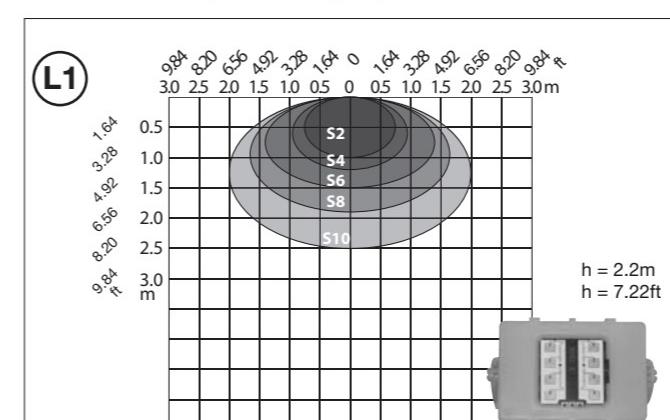


Sensing field adjustment according to Sensitivity setting and mounting Height

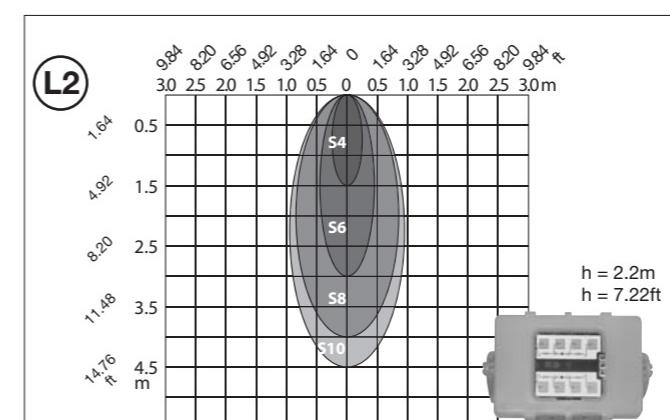
The sensing field area size (lobe) depends on the sensitivity parameter setting and the radar mounting height.

RAD 01 Bidirectional Model

Detection area vs Sensitivity value (vertical angle 45°); vertical mount mode.

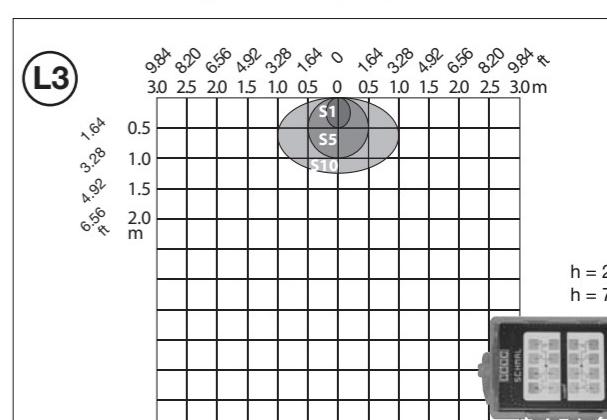


Detection area vs Sensitivity value (vertical angle 45°); horizontal mount mode.

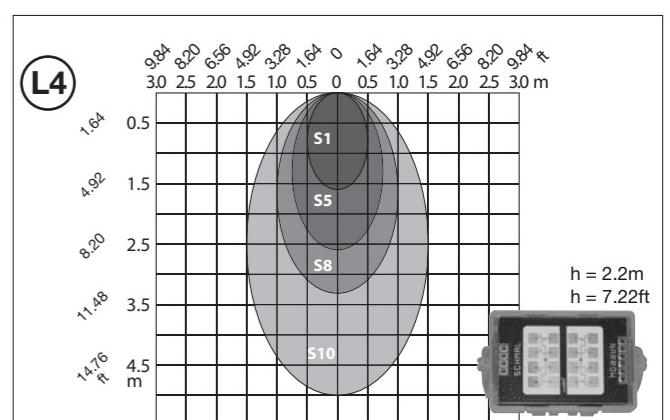


RAD 02 Uni & Bidirectional Model

Detection area vs Sensitivity value (vertical angle 15°).



Detection area vs Sensitivity value (vertical angle 45°).



Note: S1...S10 sensitivity levels setting.

Adjustment and Setting

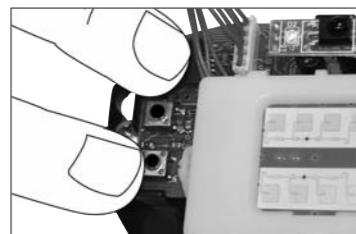
Manual Setting Device	By two buttons on main PCB board.
Remote Setting Device	IR remote controller (optional)
Reset to factory set Value (only by PCB buttons)	1 - Restore PIN security code 2 - Restore all factory values
Sensitivity	10 levels (1 to 10) It allows increment or decrement of detection field. 10 levels (0.5 to 9s) It fixes the maintenance's time of the relay status. It sets direction mode detection (only for uni-directional device). "Quasi-presence". Normal mode, Increased Immunity (Implemented by a digital filter)
Relay hold time	Relay status Active, Passive, (only by PCB buttons) Automatic mode/ Permanently Open/Close.
Uni-directional mode	Security code (only by IR remote controller)
Immunity detection	10 (max level) 1 (min: 0.5 sec) Bi-directional (Uni-directional mode is available only for RAD 02) Immunity: OFF ; Quasi-Presence: OFF Passive 0000 - block disabled (only for remote controller)

Factory Default Value

The device is set up in factory at the following default values:
1. Sensitivity: 2. Relay hold time: 3. Uni-Bidirectional Detection Mode
4. Immunity detection: 5. Relay Status: 6. PIN security:
At the first start up, the device loads the default values.
10 (max level) 1 (min: 0.5 sec) Bi-directional (Uni-directional mode is available only for RAD 02) Immunity: OFF ; Quasi-Presence: OFF Passive 0000 - block disabled (only for remote controller)

Programming procedure

Radar set value can be modified through the two buttons on the main PC board (On Board setting procedure) or with the IR remote controller [optional] (IR remote controller setting). The differences between on board settings procedure and IR controller settings procedure are only in "Relay status", "Restore" and the "PIN security code" features. "Restore" feature is only available by on board push buttons while PIN security code function is available only by remote controller. "Relay status feature" is partly available by on board push buttons and partly by remote controller.



On board setting procedure

It is necessary to press simultaneously for 1 second the two PC-board buttons DEC(-) and INC(+) to enter in programming procedure. When the two buttons are released the Green LED states permanently active (ON) so the device is ready to be set. Next setting action must be done in 20 seconds, otherwise the device return in normal operation mode and it's necessary to restart.

PIN Security code

The remote controller device can be disabled inserting a four numbers PIN code therefore. All IR-remote setting functions are available only if the correct PIN is inserted. The Security feature is activated only if the PIN is different from 0000 (factory set value).

The next table shows the procedure to modify and set PIN Security code:

FOUR PIN CODE SETTING	ACTUAL PIN VALUE	STEP 1		STEP 2		STEP 3	
		USER'S ACTION	RED LED ANSWER	USER'S ACTION	RED LED ANSWER	USER'S ACTION	RED LED ANSWER
Actual PIN code = 0000 (Factory set value)	Press once "PIN" key.	Red LED will flash once.		Compose sequentially 0000 code with remote controller keyboard.	Red LED will flash twice.	Compose the new XXXX PIN value with remote controller keyboard.	The red LED will flash three times (The new XXXX PIN code now is set).
Actual PIN code = xxxx (User set value)	Press once "PIN" key.	Red LED will flash once.		Compose sequentially the actual XXXX code value with remote controller keyboard.	Red LED will flash twice if PIN code is OK; get to Step 3.	Compose sequentially the new YYYY code value with remote controller keyboard.	The red LED will flash three times (The new YYYY PIN code now is set).

The next tables show the procedure to UNLOCK and LOCK the IR remote controller keyboard.

IR REMOTE CONTROLLER UNLOCK	ACTUAL PIN VALUE	STEP 1		STEP 2		STEP 3	
		USER'S ACTION	RED LED ANSWER	USER'S ACTION	RED LED ANSWER	USER'S ACTION	RED LED ANSWER
Actual PIN code = 0000 (Factory set value)	Not available.	X		Not available.	X	Not available.	
Actual code = xxxx (User set value)	Press once "UNLOCK" key.	Red LED will flash once.		Compose sequentially the actual XXXX code value with remote controller keyboard.	Red LED will flash twice if PIN code is OK; get to Step 3.	IR remote device keyboard is activated and it's possible to use the device for setting parameters.	

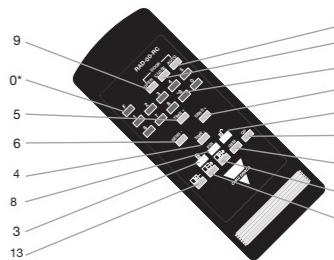
IR REMOTE CONTROLLER LOCK	ACTUAL PIN VALUE	STEP 1		STEP 2	
		USER'S ACTION	RED LED ANSWER	USER'S ACTION	RED LED ANSWER
Actual PIN code = 0000 (Factory set value)	Not available.		X		Not available.
Actual PIN code = xxxx (User set value)	Press once "LOCK" key.	Red LED will flash once.		IR remote device keyboard is disconnected and it's not possible to use the device for setting parameters.	

• Refer to the following table to change radar Set Values:

STEPS	STEP 0		STEP 1		STEP 2		STEP 3
SETTING DESCRIPTION	USER'S ACTION	GREEN LED STATUS	USER'S ACTION	RED LED STATUS	USER'S ACTION	RED LED STATUS	USER'S ACTION
PROGRAMMING PROCEDURE START UP	Press together DEC & INC per 1 sec.	Green LED switch on permanently.	X	X	X	X	Press DEC & INC per 1 sec. to go to Sensitivity (see Sensitivity STEP 1) or wait 20 sec. to end setting procedure.
SENSITIVITY	X	X	Press together DEC & INC per 1 sec.	Red LED will flash once.	Press DEC or INC per 1 sec. to increase or decrease Sensitivity current value.	Red LED flashes the number of the new set value (1...10 quick flashes).	Return to Step 2 or press DEC & INC per 1 sec. to go to Hold Time (see Hold Time STEP 1) or wait 20 sec. to end setting procedure.
HOLD TIME	X	X	Press together DEC & INC per 1 sec.	Red LED will flash twice.	Press DEC or INC per 1 sec. to increase or decrease Hold Time current value	Red LED flashes the number of the new set value (1...10 quick flashes).	Return to Step 2 or press DEC & INC per 1 sec. to go to Detection Mode (see Detection Mode STEP 1) or wait 20 sec. to end setting procedure.
DETECTION MODE	X	X	Press together DEC & INC per 1 sec.	Red LED will flash three times.	Feature available only for RAD 02 model. • RAD 01: press DEC & INC per 1 sec. to go to Immunity. • RAD 02: press INC per 1 sec. to change Detection Mode current value.	Only for RAD 02 model: 1 quick Red LED flash: Toward; 2 quick Red LED flashes: Backward; 3 quick Red LED flashes: Toward and Backward;	Return to Step 2 or press DEC & INC per 1 sec. to go to Immunity (see Immunity STEP 1) or wait 20 sec. to end setting procedure.
IMMUNITY	X	X	Press together DEC & INC per 1 sec.	Red LED will flash four times.	Press INC per 1 sec. to change Immunity current value.	1 quick flash: Immunity ON, QP OFF; 2 quick flashes: Immunity OFF, QP ON; 3 quick flashes: Immunity ON, QP ON; 4 quick flashes: Immunity OFF, QP OFF;	Return to Step 2 or press DEC & INC per 1 sec. to go to Relay Status (see Relay Status STEP 1) or wait 20 sec. to end setting procedure.
RELAY STATUS	X	X	Press together DEC & INC per 1 sec.	Red LED will flash five times.	Press INC per 1 sec. to change Relays Status current value	1 quick flash: Relay mode PASSIVE (NO); 2 quick flashes: Relay mode ACTIVE (NC);	Return to Step 2 or press DEC & INC per 1 sec. to go to Restore (see Restore STEP 1) or wait 20 sec. to end setting procedure.
RESTORE	X	X	Press together DEC & INC per 1 sec.	Red LED will flash six times.	Press INC per 1 sec. to change Restore current value.	1 quick flash: Restore PIN to 0000 2 quick flashes: Restore all to factory default values.	Return to Step 2 or wait 20 sec. to end setting procedure.

IR remote controller setting procedure

Please refer to the following tables in order to modify radar parameters setting with remote controller. All changes made by remote controller, except (OPEN, CLOSE and AUTO), are stored into the radar memory and reloaded during radar restart.



* Not available

KEY	FUNCTION	RED LED RESPONSE	GREEN LED RESPONSE	KEY	FUNCTION	RED LED RESPONSE	GREEN LED RESPONSE
1 0..9	Numerical keys	NONE	NONE	9 OPEN	Press "OPEN" key to disable normal radar detection functionality and to set Relay Status output always ACTIVE.	NONE	Always ON
2 UNLOCK	If PIN is not equal to 0000 (factory default value), press "UNLOCK" key and insert the correct PIN code to enable remote controller setting.	See next table	NONE	10 CLOSE	Press "CLOSE" key to disable normal radar detection functionality and to set Relay Status output always NOT ACTIVE.	NONE	Always OFF
3 LOCK	If PIN is not equal to 0000 (factory default value), press "LOCK" key to disable remote controller setting.	See next table	NONE	11 AUTO	Press "AUTO" key to available normal radar detection functionality.	NONE	NONE
4 TIME -	Press "TIME -" key to decrease Hold Time set value.	1...10 quick flash	NONE	12 IMM	Press "IMM" key once to activate or twice to disable Immunity feature.	1 quick flash: ON 2 quick flashes: OFF	NONE
5 TIME +	Press "TIME +" key to increase Hold Time set value.	1...10 quick flash	NONE	13 FORWARD	Press "FORWARD" key to activate unidirectional motion detection towards the sensor (available only for RAD 02).	1 quick flash	NONE
6 SENS -	Press "SENS -" key to decrease Sensitivity set value.	1...10 quick flash	NONE	14 BACKWARD	Press "BACKWARD" key to activate unidirectional motion detection away from the sensor (available only for RAD 02).	2 quick flashes	NONE
7 SENS +	Press "SENS +" key to increase Sensitivity value.	1...10 quick flash	NONE	15 BOTH	Press "BOTH" key to activate bi-directional motion detection towards or away from the sensor (available only for RAD 02).	3 quick flashes	NONE
8 PIN	Press "PIN" key to change 4-number PIN (It's necessary to insert the user PIN code if it's different from Factory Default Value).	See next table	NONE	16 QP	Press "QP" key once to activate or twice to disable Quasi-Presence feature.	1 quick flash: ON 2 quick flashes: OFF	NONE

Trade Name: Carlo Gavazzi Logistics S.p.A.

via Milano 13, I-20020 Lainate (MI)

Model No: RAD01 / RAD01N

FCC ID: U7PRAD01
IC: 7118A-RAD01

Model No: RAD02 / RAD02N

FCC ID: U7PRAD02
IC: 7118A-RAD02

This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



Box Content

- Motion Radar Sensor
- Tie Clip for sensor fixing (RAD 01)
- Connecting cable
- Screws and anchor fixing set
- Instruction manual

Ordering Key

RAD 01

Type

Detection mode

Type selection

Detection Mode
Bidirectional*
Uni&Bi-directional*

RAD 00 RC

Type

IR remote controller

General data

Sensing field orientation	double mechanical adjustment, lateral and vertical	Frequency emitted (K-Band) 24.125GHz <16dBm EIRP

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ON BOARD QUICK SET-UP TABLE



0 G					
START PROGRAMMING INICIAR EL PROGRAMA DEBUT DE PROGRAMMATION INIZIO PROGRAMMAZIONE PROGRAMMIERUNGSANFANG START INSTELLINGEN					
STEPS	1	2			
	ACTION	LED	ACTION	LED	ACTION
1 R SENSITIVITY SENSIBILIDAD SENSIBILITÉ SENSIBILITÀ EMPFINDLICHKEIT GEVOELIGHEID		 R x 1	 	 R x 1...x 10	>20s
2 R HOLD TIME TIEMPO DE RETARDO TEMPS DE MAINTIEN DU RELAIS TEMPO DI MANTENIMENTO DEL RELAIS HALTEZEIT DES RELAIS ACTIVERINGSTIJD RELAIS		 R x 2	 	 R x 1...x 10	>20s
3 R DETECTION MODE MODO DE DETECCIÓN DÉTECTION MODALITÀ DI RILEVAMENTO BETRIEBSART DETECTIE PRINCIPE		 R x 3	 	 R x 1 R x 2 R x 3	>20s
4 R IMMUNITY INMUNDAD IMMUNITÉ IMMUNITÀ IMMUNITÄT IMMUNITEIT		 R x 4			>20s
5 R RELAY STATUS ESTADO DEL RELÉ ÉTAT DU RELAIS STATO DEL RELÉ RELAYSZUSTAND RELAYS STATUS		 R x 5		 R x 1 R x 2	>20s
				 R x 1 R x 2	
6 R RESTORE RESTABLECIMIENTO RÀZ DES PARAMÉTRAGES D'USINE RESET SETTAGGI DI FABBRICA RÜCKSTELLUNG RESET		 R x 6		 R x 1 R x 2	>20s
				 R x 1 R x 2	

RED BLINKING LED
LED ROJO PARPADEANTE
LED ROUGE CLIGNOTANT
LED ROSSO LAMPEGGIANTE
ROTE BLINKEN LED-ANZEIGE
RODE LED HET KNIPPEREN

G GREEN LED
LED VERDE
LED VERT
LED VERDE
GRÜNE LED-ANZEIGE
RODE LED HET KNIPPEREN

- DECREASE
DISMINUIR
DIMINUIR
DIMINUIRE
KÜRZEN
VERMEERDEREN

+ INCREASE
AUMENTAR
AUGMENTER
AUMENTARE
ERHÖHEN

Specifications are subject to change without notice. Pictures are just an example.

QUICK SET-UP TABLE BY REMOTE CONTROL



ACTION/LED	DESCRIPTION		DESCRIPTION	ACTION/LED
	OPEN		CLOSE	
	NUMMERCIAL KEYS TECLA NUMÉRICA PAVÉ NUMÉRIQUE TASTIERA NUMERICA NNUMLERIEKE TOETSEN		AUTO	
(+) Rf ×1...×10	HOLD TIME TIEMPO DE RETARDO TEMPS DE MAINTIEN DU RELAIS TIEMPO DI MANTENIMENTO DEL RELÉ HALTEZEIT DES RELAIS ACTIVERINGSTIJD RELAIS		SENSITIVITY SENSIBILIDAD SENSIBILITÉ SENSIBILITÀ EMPFINDLICHKEIT GEVOELIGHEID	(+) Rf ×1...×10
(-) Rf ×1...×10	SENSITIVITY SENSIBILIDAD SENSIBILITÉ SENSIBILITÀ EMPFINDLICHKEIT GEVOELIGHEID		HOLD TIME TIEMPO DE RETARDO TEMPS DE MAINTIEN DU RELAIS TIEMPO DI MANTENIMENTO DEL RELÉ HALTEZEIT DES RELAIS ACTIVERINGSTIJD RELAIS	(-) Rf ×1...×10
Refer to the manual Referirse al manual Consulter la notice Riferarsi al manuale Siehe Manual Raadpleed de handleiding	LOCK		PIN Key Código PIN Code PIN Codice PIN PIN Code PIN Code	Refer to the manual Referirse al manual Consulter la notice Riferarsi al manuale Siehe Manual Raadpleed de handleiding
Rf ×1 →	DETECTION MODE MODO DE DETECCIÓN DÉTECTION MODALITÀ DI RILEVAMENTO BETRIEBSART DETECTIE PRINCIPE		UNLOCK	Refer to the manual Código PIN Consulter la notice Riferarsi al manuale Siehe Manual Raadpleed de handleiding
Rf ×2 ←	DETECTION MODE MODO DE DETECCIÓN DÉTECTION MODALITÀ DI RILEVAMENTO BETRIEBSART DETECTIE PRINCIPE		QUASI PRESENCE	Rf ×1 ON Rf ×2 OFF
Rf ×3 ↔	DETECTION MODE MODO DE DETECCIÓN DÉTECTION MODALITÀ DI RILEVAMENTO BETRIEBSART DETECTIE PRINCIPE		IMMUNITY INMUNDAD IMMUNITÉ IMMUNITÀ IMMUNITÄT IMMUNITEIT	Rf ×1 ON Rf ×2 OFF